Prevention of Significant Air Quality Deterioration Review

Final Determination

June 2015

Facility Name: Elba Liquefaction Terminal
City: Savannah
County: Chatham
AIRS Number: 04-13-051-00263
Application Number: TV-22352
Date Application Received: May 27, 2014

State of Georgia
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BACKGROUND

On May 20, 2014, Southern LNG Company, LLC submitted PSD Permit Application No. 22352, dated May 20, 2014 for the construction and operation of a natural gas liquefaction and exporting terminal named Elba Liquefaction Terminal (hereinafter "facility.") The facility is located at 1 Elba Island Road in Savannah, Chatham County. The proposed project will include the construction and operation of ten Moveable Modular Liquefaction System (MMLS) units that will treat feed gas (natural gas) and cool it until it is liquefied. To support the MMLS units, the facility proposes to construct and operate two heating medium (HM) heaters (ID Nos. F001 and F002), two thermal oxidizers (ID Nos. V402 and V403), two process flares (ID No. F007, a combination of Flares F4007 and F4008), one marine flare (ID No. F301), two diesel emergency generators (ID Nos. P001 and P002), one fire water pump (ID Nos. G059), and two storage tanks (ID Nos. D004 and D007).

On March 5, 2015, the Division issued a Preliminary Determination stating that the modifications described in Application No. TV-22352 should be approved. The Preliminary Determination contained a draft Air Quality Permit for the construction and operation of the equipment.

The Division requested that Elba Liquefaction Terminal place a public notice in a newspaper of general circulation in the area of the existing facility notifying the public of the proposed construction and providing the opportunity for written public comment. Such public notice was placed in *Savannah Morning News* (legal organ for Chatham County) on March 25, 2015. The public comment period expired on April 24, 2015.

During the comment period, comments were received from the facility. There were no comments received from the U.S. EPA Region IV or the general public.

A copy of the final permit is included in Appendix A. A copy of written comments received during the public comment period is provided in Appendix B. A copy of the updated facility-wide and site-wide potential-to-emit (PTE) calculation is provided in Appendix C.

ELBA LIQUEFACTION TERMINAL COMMENTS

Comments were received from Mr. Wayne Parrott, EHS Specialist, by letter on April 24, 2015. The comments are produced, verbatim, below and are followed by EPD's responses.

Comment 1

Reorganize Flare Emissions: In ELC's September 2014 update submittal to GEPD, ELC regrouped the flare emissions to combine the pilot emissions with their associated flare. The draft permit reflects the pilots grouped as a separate source. ELC submits a copy of GEPD's calculations that have been annotated to show the same emission rates as GEPD's last version, but with the flares and pilots combined. See Attachment A.

EPD Response:

The Division agrees with the facility's comment. The Division has updated the spreadsheets, which are included in Appendix C of the Final Determination, for calculating the facility-wide and site-wide (the combined site of Southern LNG Company, LLC – Elba Island LNG Terminal and Elba Liquefaction Terminal) potential-to-emit (PTE) for all criteria pollutants, total greenhouse gases (Total GHG), and hazardous air pollutants (HAPs). According to the spreadsheets, the Division concurs with the facility's estimated emission rates.

Please see the EPD response to Comment 3 for the permit conditions that are affected by this change.

Comment 2

Revise Vent Rates to the Process (HF/LF) Flare: ELC has made corrections to the Process Flare and pilot emission calculations. ELC submits a revised copy of GEPD's calculations showing the updated flaring rates along with a revised copy of ELC's calculations in the same format as the September 2014 submittal. See page 2 of Attachment B. These changes resulted in no significant hourly emission increases for modeled pollutants CO and HAPs, therefore no modeling is impacted.

One of the corrections involves seal vents to the Process Flare. These emissions estimates were originally included in ELC's permit application but have been revised. ELC plans to install dual mechanical seals on its MRC compressors. As an emission control, the will direct any leakage to the Process Flare, resulting in emissions from the combustion of that vent in the flare. To explain further, these particular MRC compressors will have a modern shaft-seal configuration that directs any leakage to a collection system, in this case the Process Flare.

EPD Response:

The Division agrees with the facility's comment. The spreadsheets in Appendix C reflect the changes described in Comment 2. The Division concurs with the facility's estimated emission rates.

Note that the combined heat input capacity of the pilots of Flare F007 (2.94 MMBtu/hr) is insignificant to the heat input capacity of F007 (1,432 MMBtu/hr). Therefore, the Division agrees with the facility that combining pilot emissions with the associate flare emissions does not cause any significant hourly emission increases for CO and HAPs; no existing modeling results are significantly impacted. Neither does this change affect the flares' CO BACT emission limit.

Including the VOC emission increases associated with the addition of the seal vents, and considering the emission decreases associated with the changes in Comment 4, the total VOC emission increases from the addition of Elba Liquefaction Terminal are still lower than 40 tpy, and therefore does not trigger any VOC PSD review.

Please see the EPD response to Comment 3 for the permit conditions that are affected by this change.

Comment 3

Marine Flare Pilots: The marine flare pilot information has been updated. The number of pilots was reduced from 34 pilots @ 71 scf/hour to 3 pilots @79 scf/hour. The updated calculations are on page 1 of Attachment B. These changes resulted in no significant hourly emission increases in the modeled pollutants CO and HAPs, therefore no modeling is impacted.

EPD Response:

The Division agrees with the facility's comment. The spreadsheets in Appendix C reflect the changes described in Comment 3. The Division concurs with the facility's estimated emission rates.

The Division received the facility's proposed application changes on April 24, 2015 and identified three notable modifications from the original permit application:

- The facility made changes to the capacity and number of pilots associated with the process flare (F007) and marine flare (F301).
- The facility changed the unit identification numbers for the thermal oxidizers, from "V002 and V003" to "V402 and V403", to avoid confusing them with existing LNG Vaporizers No. 2 and No. 3 located at an adjacent facility currently permitted under Part 70 Operating Permit No. 4922-051-0003-V-04-0 as Southern LNG Company, LLC – Elba Island LNG (Import) Terminal.
- The facility wants to combine flare pilot emissions and emissions from their associated flare (F007 or F301). This eliminates the need for a separate PSD emission limit for pilot emissions.

The changes are summarized in the table below:

Original Equipment List	Original Capacities	Total GHG Emissions (tons/year)	Revised Equipment List	Revised Capacities	Total GHG Emissions
Process Flare F007	241,917 MMBtu/yr	16,809	Process Flare F007	**267,213** MMBtu/yr	**18,566**
34 Pilots for F007 (at 71 scfh each)	2,414 scfh (2.46 MMBtu/hr)	1,260	**32** Pilots for F007 (at **90** scfh each)	**2,880** scfh (**2.93** MMBtu/hr)	**1,504**
Total emissions (F007 + Pilots)		18,069	Total emissions (F007 + Pilots)		**20,070**
Marine Flare F301	712 MMBtu/hr	11,326	Marine Flare F301	712 MMBtu/hr	11,326
34 Pilots for F301 (at 71 scfh each)	2,414 scfh (2.46 MMBtu/hr)	1,260	**3** Pilots for F301 (at **79** scfh each)	**237** scfh (**0.24** MMBtu/hr)	**124**
Total emissions (F301 + Pilots)		12,586	Total emissions (F301 + Pilots)		**11,450**
V002 or V003	32.8 MMBtu/hr	246,104	V**402** or V**403**	32.8 MMBtu/hr	246,104

scfh = standard cubic feet per hour; tpy = tons per year; MMBtu/hr or yr = million Btu per hour or year

The heat input capacity of the marine flare pilots (0.242 MMBtu/hr) and process flare pilots (2.93 MMBtu/hr) are considerably less than the heat input capacity of their corresponding marine flare F301 (712 MMBtu/hr) and process flare F007 (1,432 MMBtu/hr). Therefore, the Division agrees with the facility that combining pilot emissions with their associated flare emissions does not cause significant

hourly emission increases to CO and HAP emissions and no existing modeling results are significantly impacted. CO BACT emission limits are not affected by these changes because they are hourly limits based on a 3-hr rolling average. Total GHG emission limits however are affected by these changes because they are annual limits based on 12-month rolling totals. Where applicable, the Division will indicate if emissions from flare pilots are included in the PSD avoidance limit.

The modified conditions will read as follows:

3.2.5 The Permittee shall not cause, let, suffer, permit, or allow any gases which contain greenhouse gases (GHG) emissions in excess of the associated BACT emission standards, on a twelve rolling month basis, in the following table:
[40 CFR 52.21(j)]

Table 2. GHG BACT Limits	
Emission Unit	Emission Limits*
Heating Medium Heaters F001 and F002	100,418 tons CO_2e, Combined
Thermal Oxidizers ~~V002 and V003~~ **V402 and V403**	246,104 tons CO_2e, Combined
~~All Pilots in Process Flares F007 and Marine Flare F301~~	~~1,260 tons CO_2e, Each Flare~~
Process Flares F007 **(including pilots)**	~~16,800~~ **20,070** tons CO_2e
Marine Flare F301**(including pilots)**	~~11,326~~ **11,450** tons CO_2e
Diesel Generators P001 and P002	383 tons CO_2e, Combined
Fire Water Pump G059	28.2 tons CO_2e

* tons CO_2e = tons carbon dioxide (CO_2) equivalent

3.2.8 The Permittee shall limit the total amount of BOG/NG, process exhaust, and supplemental gas combusted in the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), process flares (ID No. F007), and marine flare (ID No. F301) to the following consumption caps during each 12-consecutive month period:
[PSD Avoidance - 40 CFR 52.21]

Table 3. NOx, VOC, and PM/PM_{10}/$PM_{2.5}$ PSD Avoidance Limits		
Emission Unit	Gas Type	Annual PSD Avoidance BOG/NG Consumption Cap
~~V002 and V003~~ **V402 and V403**	BOG/NG	301,694 MMBtu, Combined
F007 **(Excluding Pilots)**	BOG & Process Exhaust	~~241,917~~ **267,212** MMBtu
F301	Inerted Marine Exhaust and Supplemental Gas	171,384 MMBtu

Note that the above consumption caps for the flares do not apply to NG/BOG delivered to and burned by the flare pilots.
VOC = Volatile Organic Compounds
PM = Particulate Matter

5.2.3 The Permittee shall install, calibrate, maintain, and operate monitoring devices for the measurement of the indicated parameters on the following equipment. Data shall be recorded at the frequency specified below. Where such performance specification(s) exist, each system

shall meet the applicable performance specification(s) of the Division's monitoring requirements.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

a. A BOG/NG consumption meter to continuously measure and record the quantity of BOG/NG, in cubic feet, burned in each heating medium heater (ID Nos F001 and F002). Data shall be recorded monthly.
[40 CFR 60.49c(g)(2)]

b. A non-resettable hour meter to continuously measure and record the cumulative total hours of operation for the diesel generators (ID Nos. P001 and P002) and fire water pump (ID Nos. G059), each. Data shall be recorded monthly.
[40 CFR 60.4209(a)]

c. A BOG/NG consumption meter to continuously measure and record the quantity of BOG/NG, in cubic feet, burned in each thermal oxidizer (ID Nos. ~~V002 and V003~~ **V402 and V403**). Data shall be recorded hourly and monthly.

d. A device to continuously measure and record the cumulative total hours of operation for the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), each. Data shall be recorded monthly.

e. A BOG/NG consumption meter to continuously measure and record the quantity of BOG/NG, in cubic feet, consumed by all of the pilots in the process flares (ID No. F007) and marine flare (ID No. F301)**, each**. Data shall be recorded monthly.

f. Devices to measure the BOG and process exhaust flow rates, each in cubic feet, to the process flares (ID No. F007). Data shall be recorded monthly.

g. Devices to measure the supplemental gas and marine exhaust flow rates, each in cubic feet, to the marine flare (ID No. F301). Data shall be recorded monthly.

h. A device to continuously measure and record the cumulative total hours of operation for the process flares (ID No. F007). Data shall be recorded monthly.

i. A device to measure the higher heating value (HHV) of the fuel (BOG/NG) that is burned in the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**). Data shall be recorded hourly and averaged monthly.

j. A device to measure the HHV of the fuel (BOG) that is burned in the process flare (ID No. F007). Data shall be recorded hourly and averaged monthly.

k. A device to measure the HHV of the process exhaust that is burned in the process flare (ID No. F007). Data shall be recorded hourly and averaged monthly.

l. A device to measure the HHV of the supplemental gas that is burned in the marine flare (ID No. F301). Data shall be recorded hourly and averaged monthly.

6.1.7 For the purpose of reporting excess emissions, exceedances or excursions in the report required in Condition 6.1.4, the following excess emissions, exceedances, and excursions shall be reported:

[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

b. Exceedances: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) do not meet the applicable emission limitation or standard consistent with the averaging period specified for averaging the results of the monitoring)

vii. ~~Any twelve consecutive month period during which the total GHG emissions from all of the pilots in the process flares (ID No. F007) and marine flare (ID No. F301), determined in accordance with Condition 6.2.13, exceed the associated GHG BACT emission limit in Condition 3.2.5.~~

[Reserved]

xiv. Any twelve consecutive month period during which the total BOG and process exhaust heat input rate to the process flares (ID No. F007), as determined in accordance with Condition 6.2.7c., exceeds ~~241,917~~ **267,212** MMBtu.

6.2.13 ~~The Permittee shall use records obtained in accordance with Condition 6.2.5f. and the following methodology to calculate total GHG emissions from all of the pilots in the process flares (ID No. F007) and marine flare (ID No. F301), for each calendar month:~~
~~[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]~~

~~$GHG_{Pilots} = 116.9 * V_{Pilots} * 0.00102 / 2,000$~~

~~Where:~~
~~GHG_{Pilots} = Total GHG emissions from all of the pilots in F007 and F301, each, in each calendar month, combined, in ton CO_2e per month.~~
~~V_{Pilots} = Total volume of BOG/NG burned in all of the pilots in F007 and F301, each and determined in accordance with Condition 6.2.5f., during each calendar month; in ft^3/mo.~~

~~The Permittee shall calculate, using the monthly records above, the 12 month rolling total quantities of total GHG emitted from all of the pilots in F007 and F301, combined, ending in each calendar month of the reporting period specified in Condition 6.1.4.~~

[Reserved]

6.2.14 The Permittee shall use records obtained in accordance with Conditions 5.2.3j. and k., **6.2.5f.,** 6.2.7a. and b., and 6.2.8 and the following methodology to calculate total GHG emissions from the process flares (ID No. F007) for each calendar month:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

GHG_{F007} = [**116.9 * $V_{pilots, F007}$ * 0.00102 +** 576 * 2.20 * T_{F007} * 25 + 116.7 * ($V_{F007/BOG}$ * $HHV_{F007/BOG}$ + $V_{F007/PE}$ * $HHV_{F007/PE}$)] / 2,000

Where:
GHG_{F007} = Total GHG emissions from F007 in each calendar month, in ton CO_2e per month.

$V_{pilots, F007}$	**=**	**Total volume of BOG/NG burned in all of the pilots in F007, determined in accordance with Condition 6.2.5f., during each calendar month; in ft^3/mo.**
576	=	Vendor guaranteed pass through methane emissions, in kg CH_4/hr.
2.20	=	Conversion factor (1 kg = 2.20 lbs).
T_{F007}	=	Total hours of operation of F007, determined in accordance with Condition 6.2.8, during each calendar month; in hrs/mo.
25	=	Methane Global Warming Potential (GWP), unitless.
116.7	=	40 CFR 98 Subpart C GHG emission factor (excluding methane) for natural gas combustion, 116.7 lbs CO_2e/MMBtu.
$V_{F007/BOG}$	=	Total volume of BOG burned in F007, determined in accordance with Condition 6.2.7a., during each calendar month; in ft^3/mo.
$HHV_{F007/BOG}$	=	The monthly average higher heating value of BOG burned in F007, determined in accordance with Condition 5.2.3j., in MMBtu/ft^3.
$V_{F007/PE}$	=	Total volume of process exhaust burned in F007, determined in accordance with Condition 6.2.7b., during each calendar month; in ft^3/mo.
$HHV_{F007/PE}$	=	The monthly average higher heating value of process exhaust burned in F007, determined in accordance with Condition 5.2.3k., in MMBtu/ft^3.

6.2.15 The Permittee shall use records obtained in accordance with Conditions 6.2.7d. and 6.2.9 and the following methodology to calculate total GHG emissions from the marine flare (ID Nos. F301), combined, for each calendar month:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

GHG_{F301} = (**116.9 * $V_{pilots, F301}$ * 0.00102 +** 3,306,000 * N_{IV} + 116.9 * $V_{F301/SG}$ * $HHV_{F301/SG}$) / 2,000

Where:

GHG_{F301}	=	Total GHG emissions from F301 in each calendar month, in ton CO_2e per month.
$V_{pilots, F301}$	**=**	**Total volume of BOG/NG burned in all of the pilots in F301, determined in accordance with Condition 6.2.5f., during each calendar month; in ft^3/mo.**
3,306,000	=	Total GHG vendor emission rate, in lbs CO_2e per inerted vessel.
N_{IV}	=	The number of inerted vessels that receive LNG from the facility during that calendar month, recorded in accordance with Condition 6.2.9.
$V_{F301/SG}$	=	Total volume of supplemental gas burned in F301, determined in accordance with Condition 6.2.7d., during each calendar month; in ft^3/mo.
$HHV_{F007/SG}$	=	The monthly average higher heating value of supplemental gas burned in F301, determined in accordance with Condition 5.2.3l., in MMBtu/ft^3.

The Permittee shall calculate, using the monthly records above, the 12-month rolling total quantities of total GHG emitted from F301, ending in each calendar month of the reporting period specified in Condition 6.1.4.

Comment 4

Fugitive and Process (HF/LF) Flare Emissions: The fugitive emission calculations have been corrected to reduce the number of compressors in Mixed Refrigerant service from 52 to 30. The updated calculations are on page 6 of Attachment B.

EPD Response:

The Division has updated the number of compressors in Mixed Refrigerant service from 52 to 30 and the resulting emissions have also been updated. As discussed in the Division's response to Comment 2, the VOC emission increases from the addition of Elba Liquefaction Terminal stay below 40 tpy, and no VOC PSD review is triggered. The change of compressor number does not result in any change of permit conditions.

Comment 5

Performance (Stack) Testing Pre-Notification: Permit Condition 4.1.2 requires the usual 30-60 day pre-notification for performance testing. We request a special provision be added to allow a shorter 7 day minimum pre-notification for Marine Flare testing. ELC intends to give GEPD as much notification as possible, but due to the infrequent nature of the inerted ship arrivals, less time may be available to notify GEPD. This will allow ELC a shorter planning window for the Marine Flare to accommodate testing with the intent of testing an earlier ship and avoiding testing delays.

EPD Response:

The Division understands that submitting a written notice 30 days prior to the initial performance test for Flare F301 may be difficult because it is difficult to predict when an infrequent inerted ship will arrive at Elba Island. Therefore, the Division agrees with the facility's comment and has made the following changes in Condition 4.2.3 to allow flexibility for the notice submittal due date.

4.2.3 The Permittee shall conduct an initial performance test on each of the process flares (ID No. F007) and marine flare (ID No. F301) for visible emissions, determine the heating value of the gas venting to the flare, and calculate the exit velocity from the flare using the procedures in 40 CFR 60.18 according to the following testing schedule:
[391-3-1-.02(3) and 391-3-1-.02(6)(b)1.(i)]

a. The initial performance test on F007 must be conducted within 180 days after initial startup of the flares in conjunction with the natural gas liquefaction process.

b. The initial performance test on F301 must be conducted within 180 days after the first inerted vessel loading event. **In lieu of the requirement specified in Condition 4.1.2, the Permittee shall provide the Division a written notice of the date of the performance test on F301 and a test plan in accordance with Division guidelines at least seven (7) days prior to the test date.**

Comment 6

Thermal Oxidizer Monitoring: There is quarterly portable-analyzer testing for NOx, CO, and O2 on the Thermal Oxidizers (V002 and V003) in Permit Condition 5.2.5. The equation for Thermal Oxidizer emissions in Permit Conditions 5.2.5d. and e. underestimate the CO and NOx emissions because they underestimate the volumetric flow rate of the stack gases. The F_d factor accounts for combustion gases associated with the fuel gas burned, but does not account for the pass-through inert gases in the exhaust. ELC proposes 5.2.5d. and e. be replaced with a requirement for ELC to submit a test protocol with the equation to be used for calculating the CO and NOx emissions at least 30 days prior to the first required quarterly compliance test.

ELC proposes the following language be used in place of Condition 5.2.5d. and e.:

The Permittee shall submit a test protocol with the equations to be used for calculating the CO and NOx emnissions (lb/MMBtu) at least 30 days prior to the first required quarterly compliance test.

EPD Response:

The Division agrees with the facility's comment that using the equations in Conditions 5.2.5d. and e. of the draft PSD permit will underestimate CO and NOx emissions from the thermal oxidizers because these equations do not account for CO in the pass-through inert gases and any NOx/CO emissions from the combustion of the trace hydrocarbons in the acid gas stream. In order to correctly account for CO emissions from all sources through the thermal oxidizer stack, in addition to the portable analyzer measurements, the facility would have to measure exhaust flow rates, moisture content, temperature, and oxygen/carbon monoxide concentrations; this may be even more complicating than a Method 7E/Method 10 performance testing.

One alternative is to develop a representative relationship (a unique Fd factor for the thermal oxidizers) between NOx/CO concentration in ppmv and NOx/CO concentration in lb/MMBtu during the initial

performance test required in Condition 4.2.2. The facility will need to submit a test protocol, within their initial performance test plan required in Condition 4.1.2, that explains how they will establish such a relationship. The Division's Industrial Source Monitoring Program (ISMP) agrees with the permitting program that this is a more acceptable alternative than a quarterly portable analyzer testing in combination of a series of different measurements/tests. Therefore, instead of requiring such test protocol "*at least 30 days prior to the first required quarterly compliance test,*" the Division requires the submittal of such test protocol "at least 30 days prior to the initial performance test." As a result, Conditions 4.2.2 and 5.2.5 have been modified to the following:

4.2.2 Within 180 days after the initial startup of the thermal oxidizers in conjunction with the natural gas liquefaction process, the Permittee shall conduct performance tests for the emission of CO and NOx from ~~V002 and V003~~ **V402 and V403** as follows:
[391-3-1-.02(3) and 391-3-1-.02(6)(b)1.(i)]

a. The Permittee shall conduct CO performance tests to determine initial compliance with the associated CO BACT emission limit in Condition 3.2.4. The results of the CO performance tests shall be presented in the unit of pound per million Btu (lb/MMBtu) and pound per hour per thermal oxidizer (lb/hr-thermal oxidizer).

b. The Permittee shall conduct NOx performance tests to determine initial compliance with the vendor guaranteed NOx emission factor, 0.1 lb/MMBtu.

c. The above CO and NOx performance tests shall be conducted simultaneously.

d. Using data acquired by the continuous monitoring system (CMS) required by Condition 5.2.2, the Permittee shall determine the acceptable combustion zone temperature range between which compliance with the CO BACT emission limit in Condition 3.2.4 and the 0.1-lb/MMBtu vendor guaranteed NOx emission factor is demonstrated.

e. The results of the performance test(s) shall be submitted to the Division within 60 days of the completion of testing. The Permittee shall also submit, with performance test report, the acceptable combustion zone temperature range established in accordance with Paragraph d. and the CMS data upon which the range is based.

f. The Permittee shall establish a relationship between NOx/CO concentrations in ppmv and NOx/CO concentrations in lb/MMbtu for V402 and V403 during the initial performance tests. A test protocol that explains how to establish such relationship must be included in the test plan specified in Condition 4.1.2.

5.2.5 The Permittee shall monitor emissions of CO and NOx from each of the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**) using the following protocol:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

a. Measurements of CO and oxygen (O_2) concentrations shall be conducted according to *ASTM D 6522 – Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable analyzers or the combination of Methods 10 and 3A to determine carbon monoxide (CO) and oxygen emissions*. The measurement period shall consist of one (1) test run thirty minutes in duration.

b. Measurements of NO_X and O_2 concentrations shall be conducted according to *ASTM D 6522 – Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable analyzers or the combination of Methods 7E and 3A to determine nitrogen oxides (NO_X) and oxygen emissions*. The measurement period shall consist of one (1) test run thirty minutes in duration.

c. Measurements of CO, NOx, and O_2 concentrations specified in Paragraphs a. and b. shall be conducted simultaneously.

d. ~~CO emissions (lb/MMBtu) from V002 and V003 shall be determined using the following equation:~~

$$~~E_{CO} = K_{CO} \times C_{d,CO} \times F_d \times \frac{20.9}{20.9 - O_2}~~$$

~~where~~
~~E_{CO} = CO emission rate (lb/MMBtu)~~
~~K_{CO} = Conversion factor for CO, 7.263 x 10^{-8} ([lb/scf]/ppm)~~
~~$C_{d, CO}$ = Concentration of measured CO (ppm by volume, dry basis)~~
~~F_d = F factor for BOG/NG = 8,710 (dscf/MMBtu)~~
~~O_2 = Exhaust gas O_2 concentration (percent by volume, dry basis)~~

The Permittee shall convert the measured CO concentration from ppmv to lb/MMBtu using the data obtained in accordance with Condition 4.2.2f.

e. ~~NOx emissions (lb/MMBtu) from V002 and V003 shall be determined using the following equation:~~

$$~~E_{NOx} = K_{NOx} \times C_{d,NOx} \times F_d \times \frac{20.9}{20.9 - O_2}~~$$

~~where~~
~~E_{NOx} = NOx emission rate (lb/MMBtu)~~
~~K_{NOx} = Conversion factor for NOx, 1.194 x 10^{-7} ([lb/scf]/ppm)~~
~~$C_{d, NOx}$ = Concentration of measured NOx (ppm by volume, dry basis)~~

The Permittee shall convert the measured NOx concentration from ppmv to lb/MMBtu using the data obtained in accordance with Condition 4.2.2f.

f. The Permittee shall conduct measurements of CO, NOx, and O_2 concentrations at a frequency of once per calendar quarter (quarters ending March 31, June 30, September 30 and December 31). Measurements shall be conducted on ~~V002 and V003~~ **V402 and V403** during any calendar quarter that the unit is operated for 72 hours or more.

g. Following any measurement that is determined to be greater than the associated CO BACT emission limit specified in Condition 3.2.4 (using the methodology specified in Condition 6.2.10) or 0.1 lb/MMBtu NOx, the Permittee shall make adjustments to the thermal oxidizer and conduct a new measurement within one day. Daily measurements shall be continued until a measurement shows that both the CO and NOx emissions are less than the applicable emissions limit/rate at which time quarterly measurements may be resumed.

h. Records of CO and NOx monitoring shall be kept in a form suitable for inspection or submittal for a period of five (5) years. The record shall at a minimum contain the cause and corrective action for all excursions, and all measurements of concentration of carbon monoxide and oxygen.

Comment 7

Recordkeeping & Reporting: Permit Condition 6.1.7.c.i. defines an excursion for the heating medium heaters (F001 & F002) as:

Any 3-hour rolling average NOx emission rate, measured and recorded in accordance with Condition 5.2.1a., except during the SCR downtime allowed by Condition 3.2.7, that is in excess of the vendor guaranteed after-controlled NOx emission factor, 0.0045lb/MMBtu, for any heating medium heaters (ID Nos. F001 and F002).

Since NOx is not a BACT pollutant in this permit and NO BACT related emission factor is required, there should not be a short-term (3-hour average) emission rate requirement. On page 12 of the Preliminary Determination it states "*The facility assumed a 90-percent NOx control efficiency by the SCR, however, F001 and F002 are not subject to any NOx emission limit."* ELC proposes the 3-hour rolling average NOx emission rate excursion, as defined above, be replace with an annual (TPY) emission limit excursion for NOx as measured by the CEMS (proposed voluntarily by ELC) on a twelve month basis. This would be more appropriate for a PSD avoidance limit excursion since NOx is not a BACT pollutant.

ELC proposes the following definition of excursion:

Any twelve consecutive month period during which the total NOx emissions for both heating medium heaters(ID Nos. F001 and F002), as determined by Condition 5.2.1a, exceeds 4.54 tons.

ELC also proposes the 12-month rolling emission rate be used to trigger a Title V permit amendment application as captured in the proposed condition below.

If the twelve consecutive month total NOx emissions are above 4.54 tons for both heaters combined, and the cause of such excursion cannot be corrected, the Permittee shall, within 90 days after such excursion event, submit a Title V permit amendment application that states how the Permittee would avoid being subject to a NOx PSD review in the modification included in PSD Permit Application No.

22352, dated May 20, 2014.

Note: the 4.54 TPY NOx is the PTE value for both heaters as submitted in the permit application.

EPD Response:

The Division agrees with the facility that the addition of Elba Liquefaction Terminal does not trigger a NOx PSD review, and the heat medium heaters (ID Nos. F001 and F002) are not subject to any NOx BACT emission limit. Using the vendor pre-control (when SCR is down for maintenance) and after-control NOx emission factors and assuming 8,760 hours per year of operation, NOx PTE from F001 and F002, combined, is 4.53 tpy; addition of Elba Liquefaction Terminal will cause a NOx emission increase less than the PSD significance level, 40 tpy, and therefore does not trigger a NOx PSD review.

Note that, for other emission units and for NOx and other PSD avoidance pollutants using vendor emission factors, the Division requires that the facility prove the associate emission factors only once (near the initial startup of the associate emission units in conjunction with the natural gas liquefaction process). The facility's comment 7 has brought to the Division's attention whether the facility must continuously prove the vendor after-control NOx emission factor for F001 and F002. Considering that the vendor pre-control NO emission factor is close to the U.S. EPA AP-42 NOx emission factor found in Chapter 1.4, and the assumed 90-percent NOx control efficiency by a selective catalytic reduction (SCR) control device is very reasonable, proving the vendor after-control NOx emission factor is very likely. The Division has determined that demonstrating compliance with the vendor after-control NOx emission factor need not be repeated. Therefore, the excursion defined in Condition 6.1.7c.i has been removed by the final PSD permit; Condition 4.2.1 has also been modified to require the initial verification of the heaters' NOx emission factors. Note that the NOx CEMS/PEMS specified in Condition 5.2.1 are still a voluntary monitoring protocol by the facility.

4.2.1 Within 180 days after the initial startup of the heaters in conjunction with the natural gas liquefaction process, the Permittee shall conduct performance tests for the emission of carbon monoxide on each of the above emission units to determine initial compliance with the CO BACT emission limit in Condition 3.2.4. The results of the performance test(s) shall be submitted to the Division within 60 days of the completion of testing.
[391-3-1-.02(3) and 391-3-1-.02(6)(b)1.(i)]

The Permittee shall, during the initial CO performance testing, use the NOx CEMS/PEMS specified in Condition 5.2.1 to verify the vendor guaranteed after-control NOx emission factor, 0.0045lb/MMBtu. If the Permittee fails to demonstrate compliance with such NOx emission factor, the Permittee shall, within 90 days after the completion of the test, submit a Title V permit amendment application that states how the Permittee will avoid being subject to a PSD review for that pollutant in the modification included in PSD Permit Application No. 22352, dated May 20, 2014.

6.1.7 For the purpose of reporting excess emissions, exceedances or excursions in the report required in Condition 6.1.4, the following excess emissions, exceedances, and excursions shall be reported:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

c. Excursions: (means for the purpose of this Condition and Condition 6.1.4, any departure from an indicator range or value established for monitoring consistent with any averaging period specified for averaging the results of the monitoring)

i. ~~Any 3 hour rolling average NOx emission rate, measured and recorded in accordance with Condition 5.2.1a., except during the SCR downtime allowed by Condition 3.2.7, that is in excess of the vendor guaranteed after controlled NOx emission factor, 0.0045lb/MMBtu, for any heating medium heaters (ID Nos. F001 and F002).~~

~~If any 3 hour rolling average NOx emission rate is above 0.0045lb/MMBtu, and the cause of such excursion cannot be corrected, the Permittee shall, within 90 days after such excursion event, submit a Title V permit amendment application that states how the Permittee would avoid being subject to a NOx PSD review in the modification included in PSD Permit Application No. 22352, dated May 20, 2014.~~

[Reserved]

Comment 8

Recordkeeping & Reporting: Permit Condition 6.1.7.c.iii refers to the LDAR "operating requirements" when it should instead reference the "monitoring and repair requirements".

ELC proposes Permit Condition 6.1.7.c.iii read as follows:

Any failure to follow the monitoring and repair requirements specified in Condition 3.2.6.

EPD Response:

The Division agrees with the facility's comment and has modified Condition 6.1.7c.iii. accordingly.

6.1.7 For the purpose of reporting excess emissions, exceedances or excursions in the report required in Condition 6.1.4, the following excess emissions, exceedances, and excursions shall be reported:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

c. Excursions: (means for the purpose of this Condition and Condition 6.1.4, any departure from an indicator range or value established for monitoring consistent with any averaging period specified for averaging the results of the monitoring)

iii. Any failure to follow the ~~operating~~ **monitoring and repair** requirements specified in Condition 3.2.6.

Comment 9

Emission Units: The Thermal Oxidizers emission unit ID numbers are V002 and V003. These ID numbers are also being used in the Southern LNG Title V permit for two of the vaporizers. In order to reduce the possible confusion between the oxidizers and the vaporizers, EPC proposes to change the ID numbers from V002 to V402 and V003 to V403.

EPD Response:

The Division agrees with the facility's comment and has modified the following table/section/conditions. Note that the modified conditions listed under the Division's responses to Company Comments 3 and 6 already contain the updated emission unit ID number.

1.3 Overall Facility Process Description

Southern LNG Company, LLC submitted PSD Permit Application No. 22352, dated May 20, 2014 for the construction and operation of a natural gas liquefaction and exporting terminal named Elba Liquefaction Terminal (hereinafter "facility.") The facility will be constructed adjacent to Southern LNG Company, LLC-Elba Island LNG Terminal. Based on the facility's request, the facility is assigned a new AIRS number (04-13-051-00263) and will operate under a different permit (No. 4922-051-0263-V-01-0.) The facility will include the following equipment:

Phase I

- Six Moveable Modular Liquefaction System (MMLS) units that will treat feed gas (natural gas) and cool it until it is liquefied. The six MMLS units will have a combined nominal output capacity of 1.5 million tonnes per annum (MTPA, metric).
- Two heating medium heaters (HM heaters, ID Nos. F001 and F002) that will provide heating medium to the natural gas liquefaction process. Each of the HM heaters has a design input capacity of 98.1 million Btu per hour (MMBtu/hr) and will fire exclusively boil-off gas and natural gas.
- Two diesel emergency generators (ID Nos. P001 and P002) that will provide backup power to the facility. Each generator engine has a design output capacity of 3,353 horsepower (Hp), which is equivalent to 2.50 megawatts (MW).
- Two thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**) that will treat the acid gas stripped from the feed gas. Reduced sulfur compounds (primarily hydrogen sulfide, H_2S) and trace hydrocarbons in the acid gas streams will be combusted in ~~V002 and V003~~ **V402 and V403**. Each thermal oxidizer has a design input capacity of 32.8 MMBtu/hr and will fire exclusively boil-off gas and natural gas.
- A process flare system (ID No. F007, a combination of HF Flare F4007 and LF Flare F4008) that has a multi-point ground flare design with a 60-feet high fence. The purpose of this flare is for safe routing of combustible hydrocarbons for startup and shutdown of the liquefaction process, during upset conditions, and for vent streams. F007 has an instantaneous maximum input capacity of 1,432 MMBtu/hr.
- An elevated marine flare (ID No. F301) that is for safe routing of recovered vapors from liquefied natural gas (LNG) carriers (vessels/ships) at the south dock that do not contain LNG or natural gas (i.e., inerted carriers) on arrival. Such inerted carriers will generate warm hydrocarbon vapors during initial LNG loading operation which require safe routing through the dedicated marine flare. F301 has a design input capacity of 712 MMBtu/hr. With each ship unloading event, supplemental gas will be flared. The peak heat release for these events, based on process design, will be 1,000 MMBtu/hr.
- One fire water pump (ID No. G059) that will be used in the event of a fire. The pump engine has a design output of 493 Hp and will fire exclusively on distillate fuel oil.
- Two storage tanks (ID Nos. D004 and D007) for storing recovered amine and heating medium.

Phase II

- Four MMLS units that will have a combined nominal output capacity of 1.0 MTPA.

3.1. Emission Units

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**Corresponding Permit Conditions**	**ID No.**	**Description**
F001	Heating Medium Heater F4001 Input Capacity = 98.1 MMBtu/hr	40 CFR 52.21 40 CFR 60 Subpart A 40 CFR 60 Subpart Dc 391-3-1-.02(2)(d)2. 391-3-1-.02(2)(g)2.	2.2.1, 3.2.1, 3.2.4, 3.2.5, 3.2.7, 3.3.1, 3.4.2, 4.2.1, 4.2.4, 5.2.1, 5.2.3, 6.1.7, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.11, 6.2.19	CD01	Selective Catalytic Reduction
F002	Heating Medium Heater F4002 Input Capacity = 98.1 MMBtu/hr	40 CFR 52.21 40 CFR 60 Subpart A 40 CFR 60 Subpart Dc 391-3-1-.02(2)(d)2. 391-3-1-.02(2)(g)2.	2.2.1, 3.2.1, 3.2.4, 3.2.5, 3.2.7, 3.3.1, 3.4.2, 4.2.1, 4.2.4, 5.2.1, 5.2.3, 6.1.7, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.11, 6.2.19	CD02	Selective Catalytic Reduction
~~V002~~ **V402**	Thermal Oxidizer V4002 Input Capacity = 32.8 MMBtu/hr	40 CFR 52.21	2.2.1, 3.2.2, 3.2.4, 3.2.5, 3.2.8, 4.2.2, 4.2.4, 4.2.6, 5.2.2, 5.2.3, 5.2.5, 6.1.7, 6.2.1, 6.2.2, 6.2.3, 6.2.5, 6.2.6, 6.2.10, 6.2.12, 6.2.19	None	None
~~V003~~ **V403**	Thermal Oxidizer V4003 Input Capacity = 32.8 MMBtu/hr	40 CFR 52.21	2.2.1, 3.2.2, 3.2.4, 3.2.5, 3.2.8, 4.2.2, 4.2.4, 4.2.6, 5.2.2, 5.2.3, 5.2.5, 6.1.7, 6.2.1, 6.2.2, 6.2.3, 6.2.5, 6.2.6, 6.2.10, 6.2.12, 6.2.19	None	None
F007	Process Flares F4007 and F4008 Input Capacity = 1,432 MMBtu/hr (Instantaneous) Pilot Capacity = 2.46 MMBtu/hr	40 CFR 52.21	2.2.1, 3.2.2, 3.2.4, 3.2.5, 3.2.8, 4.2.3, 5.2.3, 6.1.7, 6.2.1, 6.2.5, 6.2.7, 6.2.8, ~~6.2.13,~~ 6.2.14, 6.2.19	None	None
F301	Marine Flare F4301 Input Capacity = 712 MMBtu/hr (Instantaneous) Pilot Capacity = 2.46 MMBtu/hr With Supplemental Gas up to 1,000 MMBtu/hr	40 CFR 52.21	2.2.1, 3.2.2, 3.2.4, 3.2.5, 3.2.8, 3.2.10, 4.2.3, 5.2.3, 6.1.7, 6.2.1, 6.2.5, 6.2.7, 6.2.9, ~~6.2.13,~~ 6.2.15, 6.2.19, 6.2.22	None	None
P001	Diesel Generator P4001 Output Capacity = 3,353 Hp (2.50 MW)	40 CFR 52.21 40 CFR 60 Subpart A 40 CFR 60 Subpart IIII 40 CFR 63 Subpart A 40 CFR 63 Subpart ZZZZ GA Rule 391-3-1-.02(2)(b)1. GA Rule 391-3-1-.02(2)(g)2.	2.2.1, 3.2.3, 3.2.5, 3.2.9, 3.3.2, 3.3.3, 3.3.4, 3.3.6, 3.3.7, 3.3.8, 3.4.1, 4.2.7, 5.2.3, 6.1.7, 6.2.1, 6.2.2, 6.2.6, 6.2.16, 6.2.18, 6.2.19, 6.2.20	None	None
P002	Diesel Generator P4002 Output Capacity = 3,353 Hp (2.50 MW)	40 CFR 52.21 40 CFR 60 Subpart A 40 CFR 60 Subpart IIII 40 CFR 63 Subpart A 40 CFR 63 Subpart ZZZZ GA Rule 391-3-1-.02(2)(b)1. GA Rule 391-3-1-.02(2)(g)2.	2.2.1, 3.2.3, 3.2.5, 3.2.9, 3.3.2, 3.3.3, 3.3.4, 3.3.6, 3.3.7, 3.3.8, 3.4.1, 4.2.7, 5.2.3, 6.1.7, 6.2.1, 6.2.2, 6.2.6, 6.2.16, 6.2.18, 6.2.19, 6.2.20	None	None

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**Corresponding Permit Conditions**	**ID No.**	**Description**
G059	Fire Water Pump G4059 Output Capacity = 493 Hp	40 CFR 52.21 40 CFR 60 Subpart A 40 CFR 60 Subpart IIII 40 CFR 63 Subpart A 40 CFR 63 Subpart ZZZZ GA Rule 391-3-1-.02(2)(b)1. GA Rule 391-3-1-.02(2)(g)2.	2.2.1, 3.2.3, 3.2.5, 3.2.9, 3.3.2, 3.3.5, 3.3.6, 3.3.7, 3.3.8, 3.4.1, 4.2.7, 5.2.3, 6.1.7, 6.2.1, 6.2.2, 6.2.6, 6.2.17, 6.2.18, 6.2.19	None	None
N/A	Ten Moveable Modular Liquefaction System Units	N/A	2.2.1, 3.2.6, 6.2.1, 6.1.7, 6.2.21	N/A	28VHP Leak Detection and Repair (LDAR) Program

* Generally applicable requirements contained in this permit may also apply to emission units listed above. The lists of applicable requirements/standards and corresponding permit conditions are intended as a compliance tool and may not be definitive.

3.2.2 The Permittee shall not fire any fuel other than BOG/NG, process exhaust gas, or marine exhaust gas in the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), process flares (ID No. F007), and marine flare (ID No. F301).
[40 CFR 52.21(j) and 391-3-1-.02(2)(g)2.(subsumed)]

3.2.4 The Permittee shall not cause, let, suffer, permit, or allow any gases which contain carbon monoxide (CO) emissions in excess of the associated Best Available Control Technology (BACT) emission standards, on a 3-hour rolling average, in the following table:
[40 CFR 52.21(j)]

Table 1. CO BACT Limits	
Emission Unit	Emission Limits*
Heating Medium Heaters F001 and F002	0.04845 lb/MMBtu
Thermal Oxidizers ~~V002 and V003~~ **V402 and V403**	6.17 lbs/hr Each**
Process Flares F007	0.37 lb/MMBtu
Marine Flare F301	0.37 lb/MMBtu

* lb/MMBtu = pound per million Btu
lbs/hr = pounds per hour
g/kW-hr = grams per kilowatt-hour

** 6.17 lbs CO per hour is equivalent to 0.188 lb CO per MMBtu.

5.2.2 The Permittee shall install, calibrate, maintain, and operate a temperature indicator to continuously monitor and record the combustion zone temperature of the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**). Where such performance specification(s) exist, each system shall meet the applicable performance specification(s) of the Division's monitoring requirements.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

6.1.7 For the purpose of reporting excess emissions, exceedances or excursions in the report required in Condition 6.1.4, the following excess emissions, exceedances, and excursions shall be reported:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

b. Exceedances: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) do not meet the applicable emission limitation or standard consistent with the averaging period specified for averaging the results of the monitoring)

i. Any period during which any of the heating medium heaters (ID Nos. F001 and F002), thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), process flares (ID No. F007), and marine flare (ID No. F301) burn any non-gaseous fuels.

iv. Any 3-hour rolling average CO emission rate, measured and recorded in accordance with Condition 6.2.10, that is in excess of the associated CO BACT emission limit in Condition 3.2.4 for any thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**).

vi. Any twelve consecutive month period during which the total GHG emissions from the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), combined, determined in accordance with Condition 6.2.12, exceed the associated GHG BACT emission limit in Condition 3.2.5.

xiii. Any twelve consecutive month period during which the total BOG/NG heat input rate to the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), combined, as determined in accordance with Condition 6.2.5e., exceeds 301,694 MMBtu.

c. Excursions: (means for the purpose of this Condition and Condition 6.1.4, any departure from an indicator range or value established for monitoring consistent with any averaging period specified for averaging the results of the monitoring)

ii. Any three-hour period during which the thermal oxidizer (ID Nos. ~~V002 and V003~~ **V402 and V403**) average combustion zone temperature is outside the acceptable combustion zone temperature range established in accordance with Conditions 4.2.2d. and 4.2.6d.

6.2.1 The Permittee shall furnish the Division written notification as follows:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

a. The actual date of commencement of construction of the heating medium heaters (ID Nos. F001 and F002) within 15 days after such date.
[40 CFR 60.48c(a)]

b. The actual date of initial startup, the design heat capacity, and/or type of fuel used for each heating medium heater (ID Nos. F001 and F002) within 15 days after such date.
[40 CFR 60.48c(a)]

c. The actual date of commencement of construction of the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), process flares (ID No. F007), marine flare (ID No.

F301), diesel generators (ID Nos. P001 and P002), fire water pump (ID Nos. G059), and moveable modular liquefaction system units within 15 days after such date.

d. The actual date of initial startup, the design heat capacity, and/or type of fuel used for each thermal oxidizer (ID Nos. ~~V002 and V003~~ **V402 and V403**), process flares (ID No. F007), marine flare (ID No. F301), diesel generator (ID Nos. P001 and P002), and fire water pump (ID Nos. G059), and moveable modular liquefaction system units within 15 days after such date.

e. Certification that a final inspection has shown that construction has been completed in accordance with the application, plans, specifications, and supporting documents submitted in support of the Permit.

For the purposes of this Permit, "startup" shall mean the setting in operation of a source for any purpose.
[40 CFR 52.21 and 40 CFR 60.7]

6.2.2 Within 30 days after the initial startup of Elba Liquefaction Terminal, the Permittee shall submit to the Division the following documentation:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

a. Vendor specification sheets that prove the following vendor guaranteed emission factor.
[PSD Avoidance – 40 CFR 52.21]

Table 5. Vendor Guaranteed Emission Factors for Heating Medium Heaters, Thermal Oxidizers, and Flares

Emission Unit	Pollutant	Emission Factor
F001 and F002	VOC	0.0015 lb/MMBtu
~~V002 and V003~~ **V402 and V403**	VOC	0.006 lb/MMBtu
	SO_2	4.6 lbs/hr, Each

b. U.S. EPA certifications that prove the following vendor guaranteed emission factors.
[PSD Avoidance – 40 CFR 52.21 and 40 CFR 60.4211(c)]

Table 6. Vendor Guaranteed Emission Factors for Diesel Generators and Fire Water Pump

Emission Unit	Pollutant	Emission Factor
P001 and P002	NOx	6.4 g/kW-hr
	$PM/PM_{10}/PM_{2.5}$	0.2 g/kW-hr
G059	NOx	3.0 g/Hp-hr
	$PM/PM_{10}/PM_{2.5}$	0.15 g/Hp-hr

c. U.S. EPA certifications that prove the following vendor guaranteed emission factors. [40 CFR 60.4211(c)]

Table 7. Vendor Guaranteed Emission Factors for Diesel Generators and Fire Water Pump		
Emission Unit	Pollutant	Emission Factor
P001 and P002	CO	3.5 g/kW-hr
G059	CO	2.6 g/Hp-hr

If the Permittee is not able to provide any of the above documentation, the Permittee must demonstrate compliance with the associated vendor guaranteed emission factors in accordance with the requirements specified in Conditions 4.2.4 and 4.2.7.

6.2.5 The Permittee shall use the BOG/NG consumption meters required by Conditions 5.2.3a., c., and e. of the Permit to determine and record the following:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

a. The Permittee shall record and maintain records of the amounts of BOG/NG burned in each of the heating medium heaters (ID Nos. F001 and F002) during each calendar month.
[40 CFR 60.48c(g)(2)]

b. The Permittee shall record the total volume of BOG/NG burned in F001 and F002, combined, during each calendar month.

c. The Permittee shall record the total volume of BOG/NG burned in the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), each, during each thermal oxidizer operating hour.

d. The Permittee shall record the total volume of BOG/NG burned in the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), combined, during each calendar month. Then, the Permittee shall calculate the monthly BOG/NG heat input rate into ~~V002 and V003~~ **V402 and V403**, combined, by multiplying the results by the average monthly HHV of BOG/NG determined in accordance with Condition 5.2.3i.

e. At the end of each calendar month, the Permittee shall use the monthly BOG/NG heat input data recorded in accordance with Paragraph d. to determine and record the twelve-month rolling total of BOG/NG heat input rate to ~~V002 and V003~~ **V402 and V403**, combined, by adding that month's BOG/NG heat input rate to the previous eleven month totals.

f. The Permittee shall record the total volume of BOG/NG burned in all of the pilots in the process flares (ID No. F007) and marine flare (ID No. F301), each, during each calendar month.

6.2.6 The Permittee shall use the devices required by Condition 5.2.3b. and d. of the Permit to determine and record the following:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

a. The net operating hours for maintenance and readiness testing for the diesel generators (ID Nos. P001 and P002) and fire water pump (ID Nos. G059), each, during every calendar month.

b. The net operating hours for maintenance and readiness testing for the diesel generators (ID Nos. P001 and P002), combined, during every calendar month.

c. At the end of each calendar month, the Permittee shall use the monthly operating hour records, obtained in accordance with Paragraph a., to determine and record the twelve-month rolling total of the operating hours for maintenance and readiness testing for P001 and P002, and G059, each.

d. For each of P001 and P002, and G059, the Permittee shall document how many hours are spent for emergency operation and how many hours are spent for non-emergency operation. The Permittee shall also record the time of operation of the engine and the reason the engine is in operation during that time.
[40 CFR 60.4214(b)]

e. The net operating hours for the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), combined, during every calendar month.

6.2.10 The Permittee shall use records obtained in accordance with Conditions 4.2.2a., 4.2.6a, and 5.2.3c. and i., and the following methodology to calculate the hourly CO emission rate from each thermal oxidizer (ID Nos. ~~V002 and V003~~ **V402 and V403**):
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

$HER_{CO} = EF_{CO} * V_{TO} * HHV_{TO}$

Where:

HER_{CO} = CO hourly emission rate, in lbs/hr.

EF_{CO} = CO emission factor for each thermal oxidizer, established in the most recent CO performance test specified in Conditions 4.2.2a and 4.2.6a., in lb/MMBtu.

V_{TO} = Total volume of BOG/NG burned in ~~V002 and V003~~ **V402 and V403**, each, determined in accordance with Conditions 5.2.3c., in ft^3/hr.

HHV_{TO} = The monthly average higher heating value of BOG/NG burned in ~~V002 and V003~~ **V402 and V403**, determined in accordance with Condition 5.2.3i., in MMBtu/ft^3.

The Permittee shall calculate, using the hourly records above, the 3-hour rolling average CO emission rate for each thermal oxidizer, ending in each thermal oxidizer operating hour of the reporting period specified in Condition 6.1.4.

6.2.12 The Permittee shall use records obtained in accordance with Conditions 6.2.5d. and 6.2.6e. and the following methodology to calculate total GHG emissions from the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), combined, for each calendar month:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

~~$GHG_{V002\&V003}$~~ $\mathbf{GHG_{V402\&V403}}$= [26,083 * ~~$T_{V002\&V003}$~~ $\mathbf{T_{V402\&V403}}$+ 116.9 * ~~$V_{V002\&V003}$~~ $\mathbf{V_{V402\&V403}}$* HHV_{TO}] / 2,000

Where:

~~$GHG_{V002\&V003}$~~ $\mathbf{GHG_{V402\&V403}}$	=	Total GHG emissions from ~~V002 and V003~~ **V402 and V403** in each calendar month, combined, in ton CO_2e per month.
26,083	=	Vendor guaranteed long-term pass through CO_2 emissions, in lbs CO_2/hr.
~~$T_{V002\&V003}$~~ $\mathbf{T_{V402\&V403}}$	=	Total hours of operation of ~~V002 and V003~~ **V402 and V403**, combined and determined in accordance with Condition 6.2.6e., during each calendar month; in hrs/mo.
~~$V_{V002\&V003}$~~ $\mathbf{V_{V402\&V403}}$	=	Total volume of BOG/NG burned in ~~V002 and V003~~ **V402 and V403**, combined and determined in accordance with Condition 6.2.5d., during each calendar month; in ft^3/mo.

The Permittee shall calculate, using the monthly records above, the 12-month rolling total quantities of total GHG emitted from ~~V002 and V003~~ **V402 and V403**, combined, ending in each calendar month of the reporting period specified in Condition 6.1.4.

6.2.19 The Permittee shall submit, with the report required by Condition 6.1.4, a report that contains the following records. The records shall be available for inspection or submittal to the Division upon request and contain:
[391-3-1-.02(6)(b)1(i) and 40 CFR 70.6(a)(3)(i)]

a. The 12-consecutive month total of GHG emissions from the heating medium heaters (ID Nos. F001 and F002), combined and determined in accordance with Condition 6.2.11, ending at each calendar month of the reporting period specified in Condition 6.1.4.

b. The 12-consecutive month total of GHG emissions from the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), combined and determined in accordance with Condition 6.2.12, ending at each calendar month of the reporting period specified in Condition 6.1.4.

c. The 12-consecutive month total of GHG emissions from all of the pilots in the process flares (ID No. F007) and marine flare (ID No. F301), combined and determined in accordance with Condition 6.2.13, ending at each calendar month of the reporting period specified in Condition 6.1.4.

d. The 12-consecutive month total of GHG emissions from the process flares (ID No. F007), determined in accordance with Condition 6.2.14, ending at each calendar month of the reporting period specified in Condition 6.1.4.

e. The 12-consecutive month total of GHG emissions from the marine flare (ID No. F301), determined in accordance with Condition 6.2.15, ending at each calendar month of the reporting period specified in Condition 6.1.4.

f. The 12-consecutive month total of GHG emissions from the diesel generators (ID Nos. P001 and P002), combined and determined in accordance with Condition 6.2.16, ending at each calendar month of the reporting period specified in Condition 6.1.4.

g. The 12-consecutive month total of GHG emissions from the fire water pump (ID Nos. G059), combined and determined in accordance with Condition 6.2.17, ending at each calendar month of the reporting period specified in Condition 6.1.4.

i. The 12-consecutive month total BOG/NG heat input rate to the thermal oxidizers (ID Nos. ~~V002 and V003~~ **V402 and V403**), combined and determined in accordance with Condition 6.2.5e., ending at each calendar month of the reporting period specified in Condition 6.1.4.

j. The 12-consecutive month total BOG and process exhaust heat input rate to the process flares (ID No. F007), determined in accordance with Condition 6.2.7c., ending at each calendar month of the reporting period specified in Condition 6.1.4.

k. The 12-consecutive month total volume of supplemental gas and marine exhaust heat input rate to the marine flare (ID No. F301), determined in accordance with Condition 6.2.7f., ending at each calendar month of the reporting period specified in Condition 6.1.4.

l. The 12-consecutive month total operating hours for each of the diesel generators (ID Nos. P001 and P002) and fire water pump (ID Nos. G059), determined in accordance with Condition 6.2.6c., ending at each calendar month in the reporting period.

Comment 10

Runtime for Generator & Firewater Pump: In Permit Condition 3.2.9 the runtime for the generators and the firewater pump is 100 hours during any 12-consecutive months. But Condition 3.3.7a. & d. states "per calendar year". Condition 3.3.7a. & d. should state "per any 12-consecutive month period".

ELC proposes Permit Condition 3.3.7a. should read as follows:

> *The Permittee may operate each engine for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. Maintenance checks and readiness testing of each engine is limited to 100 hours per any 12-consecutive month period. However, the Permittee may petition the Division for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the Permittee maintains records indicating that federal, state, or local standards require maintenance and testing of emergency engines beyond 100 hours per year.*

ELC proposes Permit Condition 3.3.7d. should read as follows:

> *Each of P001 and P002 may be operated up to 50 hours per year in non-emergency situations, but those 50 hours are counted as part of the 100 hours per any 12-consecutive month period for the above maintenance and testing and emergency demand response. Except as provided in Subparagraph d.i. below, the 50 hours per any 12-consecutive month period for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.*

EPD Response:

The Division agrees with the facility's comment and has modified Condition 3.3.7 accordingly.

3.3.7 The Permittee shall operate the diesel generators (ID Nos. P001 and P002) and fire water pump (ID Nos. G059) in accordance with the following:
[40 CFR 60.4211(f)(2) and (3)]

a. The Permittee may operate each engine for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. Maintenance checks and readiness testing of each engine is limited to 100 hours ~~per calendar year~~ **per any 12-consecutive month period**. However, the Permittee may petition the Division for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the Permittee maintains records indicating that federal, state, or local standards require maintenance and testing of emergency engines beyond 100 hours per year.

b. Each of P001 and P002 may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §60.17), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

c. Each of P001 and P002 may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

d. Each of P001 and P002 may be operated up to 50 hours per year in non-emergency situations, but those 50 hours are counted as part of the 100 hours ~~per calendar year~~ **per any 12-consecutive month period** for the above maintenance and testing and emergency demand response. Except as provided in Subparagraph d.i. below, the 50 hours ~~per calendar year~~ **per any 12-consecutive month period** for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

i. The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:

(A) The engine is dispatched by the local balancing authority or local transmission and distribution system operator;

(B) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.

(C) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.

(D) The power is provided only to the facility itself or to support the local transmission and distribution system.

(E) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

Comment 11

Preliminary Determination:

1. Page 57 in Section 8.0 under Facility Description in the 2nd paragraph, the firewater pump engine should be included with the diesel generators for the exception for burning BOG/NG. The language should be as follows:

The ten MLSS units will have a nominal output of 350 MMSCFD, equal to 2.5 MPTA. All fuel burning equipment, except the diesel generators and the firewater pump engine, will fire on BOG/NG.

EPD Response:

The Division agrees with the facility's comment. Although changes cannot be made to the Preliminary Determination after the draft PSD/Title V Permit is issued, the fact that the fire water pump (ID No. G059) fires on diesel fuel only is duly noted. Note that the fuel type specified in Condition 3.2.3 for G059 is correct.

APPENDIX A

AIR QUALITY PERMIT
No. 4922-051-0263-V-01-0

APPENDIX B

WRITTEN COMMENTS
RECEIVED DURING
COMMENT PERIOD

APPENDIX C

UPDATED FACILITY-WIDE AND SITE-WIDE POTENTIAL-TO-EMIT SPREADSHEET